Generative Phonology and Child Language Acquisition[1]

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1. Introduction.

To be able to pronounce acceptably the words of his native language, the child must acquire the voluntary and systematic use of his vocal tract, in the face of its many complex predispositions to reduce his efforts to homonymy. Attempts have been made to formalize both the source of this massive homonymy and the maturation stages by which it is undone, in terms of the operation of trains of processes (for the initial stage) and their unlearning (for the development). Smith (1970), the first to analyse a corpus in such a manner, called such processes 'incompetency rules', and likened their operation to that of a filter, to be unlearned as the child approaches the adult model. Meanwhile Stampe (1969) had independently made the same claims with the additional assumption that the processes are indeed innate, and asserted that they are either limited, suppressed or ordered, in the approach to the model language.

But such an account of acquisition, though it closely parallels the generative model widely adopted to account for the phonology of adult speakers, fails to distinguish between the child's passive advances in pronunciation due to increased command over coordination in the vocal tract, and the creative (though sporadic) efforts made by the child during development to undo some of the worst results of his incompetence.[2]

I have elsewhere discussed two such developmental strategies; the strategy of avoidance, and that of vicarious production mechanisms (Drachman, 1971). The first consists in the systematic avoidance of forms (as perhaps also the deletion of segments) presenting especially intractable production problems. The second consists in the temporary adoption of some alternative production mechanism which provides a closer acoustical match for a given segment of the model language than the child's own best 'proper' effort could produce.

However, a third possible strategy consists in the exploitation of a special kind of context-sensitivity, that producing vowel and consonant assimilations across syllables. These are the processes which I shall hereafter call 'long-domain processes.'

The rest of this paper is devoted first to a discussion of the ontogeny and form of such long-domain processes; then, in indicating their place in phonology, I shall show how they interact with substitution processes, and how this interaction may be exploited by the child.[3]

2. The ontogeny of long-domain processes.

At the early stage of child-development characterized by Babbling, the motor-command system for the speech-tract seems able to deliver only a rhythmically repetitive sequence of identical syllables, each consisting of a single pair of extremes of articulatory activity--thus, CV + identical CV, etc., where C is a bilabial or dental stop, and V an open vowel. This pattern has been attributed (Drachman, 1970) to a dominant neurophysiological substrate involving two common types of neural circuitry; a reciprocating type, producing alternating activity in mutually-inhibiting muscle-sub-systems; and a reverberating or closed-loop type, producing simple repetitions of this alternating activity.

Later stages of vocalization show the slow inhibition of this dominance which, however, continues to affect the output. This may be seen in the deletion of final consonants, the breaking up of clusters by simplification or vowel-insertion, as of course in the so-called reduplicating forms, all common to child language.

Now that detailed histories for individual children are becoming available, it is clear that, before the autonomy of successive syllables and the segments they contain is well established, there is a period during which both the anticipatory and the inertial influences of one syllable on its neighbor are pervasive. This is the period of the long-domain processes, a period varying from child to child and during which the course of maturation of articulatory abilities continues on its parallel way.

3. The form of long-domain processes.

Considered taxonomically, the long-domain processes I shall survey comprise syllable-harmony, vowel-harmony, consonant harmony, syllable-gain and syllable-loss, and metathesis. However, it will become clear in what follows that such a taxonomy is unrevealing, and that (for example) most putative cases of syllable-harmony and syllable-loss are probably best analyzed in terms of multiple processes.

3.1. Harmony.

Corpus (1) | Syllabic harmony.

kuneláǩi → kulaláǩi	rabbit
filipáǩi → papáǩi	Philipaki (name)

Corpus (2) Vowel harmony.

kutáli → kotáli	spoon
lemóni → mamóni	lemon
potíri → potúlri	tumbler
maxéri → mayáyi	knife
pirúni → pulúni	fork
ðulítsa → vilítsa	work

Corpus (3) Consonant harmony.

kliśí → lilí	key
kapélo → papélo	hat
lemóni → memóni	lemon
aftó eḱí → akoḱí	that (over) there!

Consider the forms under corpus (1) above. It is at first sight plausible to hold that these forms illustrate syllable-harmony; i.e., that a whole syllable has been assimilated to its neighbor. But from the forms of corpora (2) and (3), where we see the component processes at work separately, we can reasonably deduce that a form like that for 'rabbit' (Corpus 1) has in fact undergone both processes--as I shall later show more convincingly.

The forms for 'spoon', 'lemon', 'tumbler', in turn show that vowel-harmony may work by degrees, i.e., that it need not involve all the potentially affectable distinctive features of the segment concerned. In 'tumbler' moreover, the harder question arises whether harmony can operate not merely by inertia (which seems uncommon) but may even affect a stressed vowel. However, the case is equivocal: comparing the form for 'knife', it is plausible that in 'tumbler' as well as there, we have to do with the 'backing' effect of a following /r/,[4] here behaving very much as a laryngeal (Cf. Drachman and Malikouti-Drachman, 1971).

3.2. Syllable-gain.

The tendency for the substrate command-system to produce open syllables is of course not supported word-internally in Modern Greek, which permits many internal clusters. On the other hand, word-final consonants are (at least in the inherited vocabulary) seriously constrained, only /s, n/ being permitted, except in Biblical names. Thus, while the additional medial (open) syllable in 'knife' (corpus 4 below) is a canonical type of perseveration, the prosthetic initial vowel in 'mouth' is unexpected.

Now it is unlikely that this vowel in fact represents the (mistakenly Masculine for Neuter) Definite Article {o}; at this stage the child never used the Definite Article. A plausible, though more complex solution, might be to suppose that initial pre-consonantal /s/, usually lost via [h], here vocalizes at that stage, thereafter giving [o] by harmony with the following stressed vowel.

Corpus (4) Syllable-gain.

maẋéri → mayayǽi	knife
stóma → otómo	mouth

However, the fact that the corpus contains (prompted) forms such as [alávi] for [láði] 'oil' make this alternative less than convincing, and prosthetic vowels must be considered as produced by further (not well understood) processes.

3.3. Syllable-loss.

I come now to the problem of the so-called loss of syllables in child language. Considering corpus (5) below, one must first dispose of forms like those (5.a) for 'flower' and 'snail', which have clearly lost syllables but which are equally clearly not candidates for a 'syncope plus cluster-reduction' kind of analysis. Both forms in fact show semi-vocalization, rather, with subsequent loss of an intervocalic semivowel; and each form shows in addition individual processes such as vowel-harmony (for 'flower') or vowel-nasalization (for 'snail').

For the remainder of the forms here, however (5.b), the question arises whether apparent syllable loss is to be straightforwardly attributed to the 'syncope plus cluster-reduction' syndrome, or whether more mysterious factors are to be invoked--factors such as faulty representation due to inadequate perception, as has indeed been suggested (e.g., in Ingram (1971) overtly, and Garnica (1971) by implication).

Corpus (5). Syllable loss.

a.	lulúði → lulú	flower
	salingári → ãgáli	snail
b.	trapézi → péyi	table
	dométa → méta	tomato
	lemóni → móni	lemon
	lekáni → káni	basin
	sirtári → táli	drawer
	ðikómu → kómu	mine

3.4. Digression on perceptual testing.

Perceptual testing hardly seems today in a sufficiently advanced state to contribute seriously to the problem as to whether and how the child's acoustical representations might be systematically deficient or distorted.

It was first suggested by the Russian psychologist Shvachkin (1948) that children acquire the perceptual distinctions required to understand their native language in an order similar to that proposed independently for language-production in Jakobson (1941). This raises the fundamental problem, whether advances in production ability are in any simple way dependent on the development of perception. Even Garnica's promising replication of the Schvachkin tests (Garnica, 1971) fails to address itself to this crucial problem, for which it would have been necessary to carry out tests of spontaneous and prompted production for each stage of perceptual testing. In the end, the datum which must be explained by anyone holding that perception is seriously involved in the problem of production development is this: from Jespersen (1941), through Leopold (1947) and Smith (1970), the claim is found that a contrast newly produced for a given pair of segments is immediately applied

to those segments in (almost) all and only the relevant forms--and that those forms have of course not all been re-heard across the period of improvement.[5]

For the moment, the simplest working assumptions would seem to be the following. (1) With one important exception (2 below), what is in principle registered by the child is the adult surface shape of the word. The resultant Primary acoustical representation (Drachman, 1971) may, however, at once be somewhat more abstract than one consisting simply of surface allophones, certainly for segments exhibiting stylistic low-level alternations (fast-speech variants, etc.); and this may be true perhaps even for segments not exhibiting such variants, as Stampe has suggested (seminar 1972).

(2) The exceptional case is that of certain types of acoustical confusion: such are that obtaining between spectrally similar continuants such as f - θ (Cf. Tikofsky and McInish, 1968; Abbs and Minifie, 1969), and the confusions of ordering found in experiments on adults (e.g. Bond, 1971), especially in clusters containing a continuant and a stop consonant.

(3) Particular words may have inadequate or inaccurate representations, for a variety of causes. In frequently used words, adult adoption of a child's form might lead to replacement of the child's primary representation. Conversely, the acoustical representations of very infrequently heard words (especially polysyllabics) may be replaced by the feed-back (again acoustical) representation of the child's own defective output. I have the impression that it is also true that children sometimes, having 'decided' on a word's shape, simply fail to hear it correctly thereafter.

3.5. Metathesis.

The phonological status of metathesis has been much disputed, especially as a synchronic process (see for example Kiparsky (1967), but compare Webb (1971)). In this context, it is of interest that only sporadic cases of possible metathesis are found in the present corpus. On the one hand, some putative cases prove to be analyzable as resulting from multiple processes. On the other, a small residue of cases seem genuinely to involve metataesis, sometimes (Cf. corpus 9, for prompted forms) of whole syllables.

Consider the brief sample in Corpus (6) below of spontaneous forms involved.

Corpus (6) Metathesis in spontaneous forms.

kuneláǩi → kulenáǩi	rabbit
ksipóliti → tóliǩi	barefoot (plural)
síδero → lítoto	electric iron

The form for 'rabbit' above might be analyzed in terms of successive assimilation and dissimilation of resonants. The form for 'barefoot' is more complex, but again no metathesis seems required. If the vowel of the first syllable is syncopated (and

pre-tonic vowels are particularly prone to syncope), the resultant cluster will collapse; the surviving consonant (whether /k/ or /p/) then assimilates to the common articulation point of both following consonants. Lastly, the /t/ of the final syllable is palatalized by the following /i/, as is regular for the corpus.

However, 'electric iron' is problematic. It seems that the resonant [r] of /síðero/ has metathesized with the initial /s/; even in its new position, however, /s/ gives [t] (regular for the corpus). This gives us the intermediate form [ríðeto]. Initial /r/ now (regularly) gives [l], in parallel with which the medial consonant and following assimilate respectively to the final consonant and vowel. Notice that these assimilations must bleed the processes normally leading to the loss of [ð] in such a form.

4. Long-domain processes and phonology.

4.1. General.

There is a long-standing debate as to whether the rules contained in a phonology do in fact constitute a seamless web--as implied in the formulation, e.g., of Chomsky-Halle (1968)--or whether there is not some difference in status between (say, in English) the Vowel Shift and Palatalization, i.e., as between abstract rules and living phonetic processes.

That there may after all exist a natural break in the rule-series has in particular seemed supported by the evidence from slips of the tongue (Fromkin, 1971), those adult-language processes, also sporadic, most reminiscent of the long-domain processes discussed here. It has thus seemed worthwhile to pursue the parallel.

4.2. Long-domain, and other processes.

Now it seems that, since morpheme-structure conditions and rules for contextual variation always survive a 'slip of the tongue', the relevant 'slip' processes must take place at the interface between those conditions and rules and the so-called central rules of the phonology--say, in some kind of buffer short-term memory in which utterance fragments are presumably stored in preparation for transmission to the speech tract via the cranial nerves.

If long-domain processes are akin to 'slip' processes, then it ought to be the case that they too constitute a single sub-component of the phonology, again perhaps preceding the supposedly 'lower-level' rules. I shall here test this hypothesis by suggesting suitable rule derivations for typical forms in which long-domain processes are seen to operate.

Consider the proper derivation of the form for 'rabbit' in corpus (7a) below. First, notice that Consonant-Harmony and Lateral-palatalization[6] may operate in either order, equivocally so for the principle at stake. On the other hand, palatalization of /l/ must occur while the underlying /e/ follows it, i.e., before vowel

harmony, which makes this /e/ a back vowel. Thus at least one low-level processes precedes vowel-harmony, which is of course a long-domain process.

On the other hand, vowel harmony must here follow palatalization, for we should otherwise not have palatalized [ĺ] at all. And the occurrence of palatalized [ĺ] proves beyond doubt that the underlying representation in fact contains the correct vocalism (viz., /e/), since back vowels do not of course provoke palatalization. I shall revert to this matter below. For the moment, it is clear that the putative parallel between long-domain processes and 'slip' processes is not sustained: on the contrary, long-domain processes seem to interdigitate with low-level processes, at least in child phonology.[7]

Corpus (7) Local ordering.

(a) 'rabbit'		(b) 'automobile'	
	*kuneláḱi		*aftoḱínito
Cons. Harm.	kuleláḱi	Vow. = loss, & Cluster-red/n.	tokínito
Palat'n (i)	kuĺeláḱi		
Palat'n (ii)	kuĺeláḱi	Vow. Harm.	tikínito
Vow. Harm.	kuĺaláḱi	Palat'n (i)	ćiḱínito
		Palat'n (ii)	ḱiḱínito
		Vow./Cons. Harm., etc.	ḱiḱínano

Consider next the derivation for the form 'automobile' (corpus 7b) which involves the same pair of processes, viz., vowel harmony and palatalization. I assume first vowel-loss plus consonant-cluster reduction in the initial syllable. Then, in accordance with the earlier discussion, I reject syllable harmony in favor of a series of processes affecting single segments; here vowel-harmony is the only long-domain process required, for it naturally feeds two perfectly regular processes, viz., t → ć, and ć → ḱ (compare [ḱia] for /tría/ 'three', and [ḱéla] for /stéla/ 'Stella' in the same child's speech).

But it is now obvious that the two processes of vowel harmony and palatalization must operate in opposite orders for the two derivations compared (viz., 'rabbit' and 'automobile'). In the present cases, the natural (i.e., feeding) order is that vowel harmony should precede palatalization, as it does for 'automobile'. But in the case of 'rabbit' palatalization would in fact be bled by vowel-harmony. Assuming that both processes must inevitably operate in this form, it seems that their ordering is reversed so as to preserve at least the information that the underlying vowel in the affected syllable was a front vowel. This seems to confirm the naturalness of the principle of 'local ordering' of phonological processes (Anderson, 1969), a principle according to which unmarked shapes select suitable derivational orders.

5. Prompted forms.

The data presented so far represents only spontaneous utterances. But, as was noted in an earlier mention of this data (Drachman and Malikouti-Drachman, 1971), prompting was quite frequently employed to elicit or re-elicit forms. Such prompting and repeated prompting often elicited variant forms of considerable interest. However, the Pandora's box of methodological problems that this opens requires special comment, before discussion of the forms themselves and their relevance to the status of the long-domain processes.

5.1. Factors affecting imitative behavior.

It is obvious that one may unwittingly disrupt a person's (expecially a child's) performance of a skilled act simply by either asking him to repeat it or showing him how to do it and asking him to copy you. I summarize below some of the conditions for successful imitation, as well as some of the factors that may impair it.

Some positive factors are: set to imitate, boldness to hazard errors, and present ability in spontaneous activity. A prompt following silence (avoidance by the child) offers a model, and the encouragement to respond; while a prompt following an attempt by the child not only suggests that improvement is possible but perhaps does so at the maximally useful moment--compare the similar function sometimes attributed to adult sentence-completion (e.g., McNeill, 1966).

Some corresponding negative factors are: prompting may dissolve the naturally vulnerable self-confidence of the child, or simply bore him into silence; or, if the child adopts a 'rote-repetition' strategy, priority or recency effects may appear--indeed, repeated prompting for the same word may even create hallucination effects, the child searching the form in different ways or in alternant directions at each hearing. Further, it is difficult (perhaps impossible) to ascertain when or even whether a given word has been heard before, which of course calls into question whether the child's representation is from long or short-term memory. Then too, blends may occur, as a result of perseveration of interest from an earlier stimulus (picture or question).

Lastly, there is the problem of 'proximate ability' referred to by Vygotsky (1962); if the system is 'ready' for improvement, we may in repetition tasks be tapping a slightly later stage of ability. It is worth noting the perhaps sanguine assertion of Smith (1970), that whenever prompting was successful the improvement thus foreshadowed was always achieved within quite a short time.

5.2. The prompted corpus.

Having sketched in gross outline the difficulties in interpreting the results of prompting, it remains to add that the child concerned was rarely overtly disturbed by the procedure, save to syllabify an occasional form back at the investigator in a loud exasperated voice. Also, she occasionally balked at 'difficult' words, including her

first name Chrisa ([xrísa], readily repeated as [ǵíta] a month later) and her surname Philipaki, to which I shall return at the end of this paper.

In what follows, only two kinds of prompting are distinguished; prompting for repetition of a spontaneously uttered form, and prompting to elicit a known form at which the child hesitated. Some attempt is made to correlate particular kinds of 'error' with individual factors of the kind surveyed above: more important, the special status these forms must have (compared with those elicited spontaneously) is characterized in terms of varying degrees of complexity of phonological derivation.

5.3. Prompting. Repetition of spontaneous forms.

Corpus (8) below displays in parallel columns the range of response-types elicited as prompted repetitions of the corresponding spontaneous forms.

Sub-corpus (a) shows that some forms may be characterized as stable under this kind of stress. The stability of the medial glide [y] for underlying [ð] shows us the edge of a hierarchy, for between front vowels, or even between high vowels (cf. 'flower' in sub-corpus (b)), this glide is elsewhere optionally lost.

Corpus (8) Prompted repetitions.

	Adult form	→ Spontaneous	→ Prompted Repeat	
a.	póði	póyi	same	foot
	sirtári	táli	same	drawer
b.	lulúði	lulú·	loló·yi	flower
	trapézi	péyi	papéyi	table
c.	kapélo	papélo	pélo	hat
	ráðio	yá·yo	áyo	radio
	trapézi	péyi	papéyi~apéyi	table
d.	kapélo	papélo	?pélo	hat
e.	parakaló	pa·kaó	kaloló	please

Sub-corpus (b) shows the kind of improvement all well-behaved prompted forms should illustrate, in these cases the restoration of a 'lost' syllable. Note that the loss in 'flower' is not an (uncanonical) example of the loss of a post-tonic unstressed syllable; the final vowel is 'lost' only in the case that glide-loss leaves behind a vowel-sequence, whereupon vowel assimilation (and optional contraction) occurs.

For any case of a restored segment or syllable on prompted repetition, the question arises whether the child's stored production representation has been affected. It is legendary among researchers, and true for every case here, that no permanent modification in

pronunciation results from prompting; the earlier form re-appears again in later spontaneous utterance, even within the same interview (e.g., the treatment of the name Philipaki, section 5.4 below, and cf. Templin (1966); but for syntax cf. the sanguine view on sentence-completion in section 5 above).

Not surprisingly (cf. section 5.1 above), regressions occur under prompting conditions. However, Sub-corpus (c-d) contains an interesting contradiction.

Take first the story of 'hat'. If, following the information-preservation theory of the function of rule ordering discussed in 4.2 above, we hold that consonant harmony in the spontaneous form [papélo] helps to preserve the unstressed syllable, then we should claim that the inhibition of this harmony under prompting is followed by loss of the unstressed vowel, with subsequent reduction of the resulting cluster in *[kpélo]. The intermediate form [ʔpélo] under (d) seems to fully confirm this (previously mentioned) view of syllable loss, the relevant derivation being:

1. Loss of unstressed vowel ... [kpélo].
2. k gives ʔ before a dissimilar stop ... [ʔpélo].
3. Cluster reduction ... [pélo].

However, the alternation, for 'table', of [papéyi] with [apéyi] suggests at first sight that we must perhaps also recognize the occurrence of simple loss of initial consonants. But the evidence is not unequivocal here. The corpus also contains forms such as [alávi] for /láδi/ 'oil' (cf. section 3.2 above); that is, there appears an occasional inexplicable prosthetic vowel, so that we might assume that [apélo] also contains such a vowel.

A complex kind of regression under prompting is seen in sub-corpus (8e). It is obvious from the spontaneous shape that the child's underlying form for 'please' is essentially that of the adult: in this form, however, /r/ has (regularly) given [l], whereupon the two [l]'s semi-vocalize and are then lost between back vowels.

In the prompted repetition, on the other hand, the immediate acoustic image has apparently 'saved' the [l] in the stressed syllable from semi-vocalization and loss; the unstressed syllables have, however, undergone the further processes of velar harmony and following lateral-harmony, vowel-harmony and vowel-simplification. The parallel derivations are;

		Spontaneous		Prompted repetition
1.	/r/ → [l]	palakaló		palakaló
2.	semi-vocalization	paɰakaɰó	but	paɰakaló
3.	loss of s/v	paakaó		paakaló
4.	velar-harmony			kaakaló
4.	Lat-Harmony, V-Har. & V-simplification.			kalolό

5.4. Prompting of avoided forms.

The child may avoid responding for any of a number of reasons, some of which are implicit in the discussion above (section 5.1). Of linguistic interest is the fact that persistent attempts to elicit such forms by prompting often produces data 'richer in processes' than either spontaneous utterances or prompted repetitions do. Consider first Corpus 9 below.

Corpus (9) Metathesis in prompted forms.

a.	búka → gúba	mouth
	tsungrána → gudána	rake
b.	layuðáki → yulaváki	baby hare
	mikrófono → konítoto	microphone
	tsekúri → kutíᵊli	axe
c.	pondikáki → gokabɛ́·to ~ gubadáki	mouse

As was shown above (sections 3 and 3.5), complex substitutions are often best accounted for in terms of multiple processes. Corpus (a) above contains forms of this kind; we suppose that assimilation and subsequent dissimilation gives (e.g.) [búka → kúka → kúpa → gúba] for 'mouth', while 'rake' undergoes slightly more complex shifts but in principle behaves similarly.

On the other hand, the forms under (b) all contain a velar in the second (and apparently dominating) syllable: but it would in fact require quite ad hoc rules, viz., one per form, to adjust the output of velar harmony to produce the attested shapes. It seems unavoidable, since not only the consonants but also the vowels appear switched in position, that these are genuine examples of metathesis, and syllable-metathesis at that. Even more complex metatheses are seen in 'mouse' (under c), both versions seeming to involve transposition of velars to the beginning of the word.

Last, consider the problem of 'fossil' forms, i.e., forms fixed at some (early) stage of phonological development, and by-passed by other forms of similar shape. Adoption of a particular 'quaint' shape by parents often seems to have this outcome for the word concerned. Take the case of 'Philipaki', the child's surname. As will be seen from the sub-interview (corpus 10 below), four distinct shapes, including one 'correct' version, were elicited through four prompts, after the initial failure to respond. The three 'defective' forms (b, d, e) are of special interest.

Corpus (10) Sub-interview.

	Researcher (translation only)	Child response
a.	What's your name?	(no answer)
b.	Philipaki! What's your name?	[papáki]

c. Philipaki! What's your name? [filĭpáḱi]

d. What? [fi·káḱi]

e. Philipaki! Say it again. [fiḱáḱi]

f. (Some 20 minutes later) [papáḱi], spontaneously.

First, there is no question of a syllable deletion for the medial /l/--the semivocalization of /l/ between palatal vowels is perfectly regular for the corpus, as is the (optional) contraction of identical vowels that follows it. Second, since initial /f/ is attested elsewhere in the corpus, it is difficult to attribute any kind of information-conserving function to the vowel and consonant harmony resulting in [papáki], the child's stable spontaneous form. We are thus driven to the conclusion that [papáki] is probably a fossil from the earlier stage, one at which harmony did in fact preserve information. That the child's parents used the same form to the child tends to confirm this suggestion.

There remain the two forms [fi·káḱi] and [fiḱáḱi]. Under the immediate influence of the prompt, the 'fossil' is abandoned temporarily. Now we see velar harmony, (unusually) affecting the consonant in the stressed syllable. The two processes of palatalization and consonant harmony again alternate in order: if harmony precedes, [fikáḱi] results; but if palatalization precedes, later harmony reproduces the palatalized [ḱ], giving [fiḱáḱi].

But the ordering alternation here is not between different forms (as in the case of 'rabbit', as against 'automobile', earlier); for the same form appears with both orders. Neither does the non-feeding order in [fikáḱi], on the other hand, seem to conserve information in any way; both processes and orders are effectively 'blind' to the output. It must thus be the case that ordering of processes is unstable in early language acquisition. It may indeed be this very instability that enables the child to discover the information-preserving function attributed to the principle of local ordering of processes.

6. Conclusions.

This paper illustrates an important way in which the child creatively partakes in his own phonological development. The particular developmental strategy discussed is the use made of 'long-domain' processes, processes whose ontogeny is held to lie in the developing speech-tract control system. Such processes seem to contrast with the apparently similar processes characterizing 'slips of the tongue'; in particular, the former interdigitate with so-called low-level processes.

But the interaction of long-domain and low-level processes seems sporadically subject to functional control by the child, the function served being apparently the conservation of information, mediated by 'local' ordering of processes in the sense of Anderson.

From prompted form, which illustrate the extreme range of additional processes, it seems that ordering of processes is flexible during early stages of the child's development. It is suggested that this flexibility enables the child to discover and employ the principle itself of local ordering.

Footnotes

1. This paper was presented at the Zweite Internationale Phonologie-Tagung, Wien, September, 1972, and will appear in the proceedings.

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2. The claim that normal developmental improvements in pronunciation may be supplemented by creative strategies can be tested only by compiling individual case-histories, and then scrutinizing especially those data which seem to contradict the overall developmental trend, child for child. To this end, the present study presents data from only a single child, at a single stage of development in a monolingual environment; in fact, a little girl of some 27 months growing up in Athens, Greece. The corpus contains some five hundred utterances.

3. If long-domain processes have the ontogeny here supposed (section 2), they are expected to operate as blind amnesiacs, viz., without consideration either of the history of the input to them or of their own consequences. Thus we expect them to affect all relevant forms. But although such 'across the board' process-operation can sometimes be seen (e.g., in Smith, 1970), there is also much data, including the present corpus, showing only sporadic examples. In the absence of developmental studies on this point, I dare to speculate that the 'functional' use of long-domain processes occurs only during the stage when their neurophysiological basis is ceasing to be dominant.

4. It is of course the underlying /r/ that is responsible for this backing--a phenomenon hardly attributable to the surface [y]. This means of course that the form for knife is derived by the two processes (apart from the process '/x/ to [y]') backing before /r/, then glide-harmony.

5. This claim seems never to have been experimentally verified. But it would not be difficult to construct a suitable test; for example, one could use Garnica-type 'characters', withdrawing a subset from use for a period, and then re-introducing them after the relevant distinction (in, say, the first segment of their names) is perceived for the other 'characters'. At this point, the name of the re-introduced 'character' is what is to be elicited, though of course without prompting.

6. Palatalization of laterals (more generally, of dentals) is constrained in the adult language, and is provoked only by the most palatal vowel and semi-vowel (i and y). The child-form shows the wider environment 'palatal non-consonant', the natural (most general) form of the process, which she will learn to inhibit as required. Cf. [kéla] for 'Stella', in section 4.2.

7. It is not clear what implications there are here for the comparison with slips of the tongue. Certainly, the latter are never 'functional' in the sense claimed here, though of course neither ought one to claim that they are quite automatic--witness the fact that they are monitored during the process of manufacture, so that most 'slips' in fact are other words, often 'Freudian' in their relation to the intended word.

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